

## **Abstract**

Microplasma device operating at atmospheric pressure offers simple and effective route to non-equilibrium chemistry for nanomanufacturing. Gold nanoparticles are fabricated by using microplasma techniques. Optical emission spectroscopy (OES) is used to detected the species which are responsible for the production of gold nanoparticles. Morphological and optical studies of the fabricated AuNPs is done with the help of scanning electron microscopy (SEM) and ultraviolet- visible (UV- VIS) spectroscopy. It is concluded that 3-minute treatment time is reckoned to be a suitable time for the lessening of aggregation in addition to the formation of well dispersed gold nanoparticles with uniformity in their sizes ( $95\pm 10$  nm). In view of their small size reactive and large surface areas, these gold nanoparticles are highly reactive and can be utilized in various applications.